MEDICAL LABORATORY SCIENCE

Nate Harden MS, MLS(ASCP)CM

Program Director

Saint Francis Health System

SaintFrancis Health System

MEDICAL LABORATORY SCIENCE

- Medical laboratory science is a diagnostic science that involves the performance of simple to complex testing procedures in a clinical laboratory.

- Medical technologists perform lab testing on blood specimens by applying biology and chemistry principles to aid in the diagnosis of disease.

- Other names for Medical Laboratory Science: Medical Technology, Clinical Laboratory Science

MEDICAL LABORATORY SCIENCE

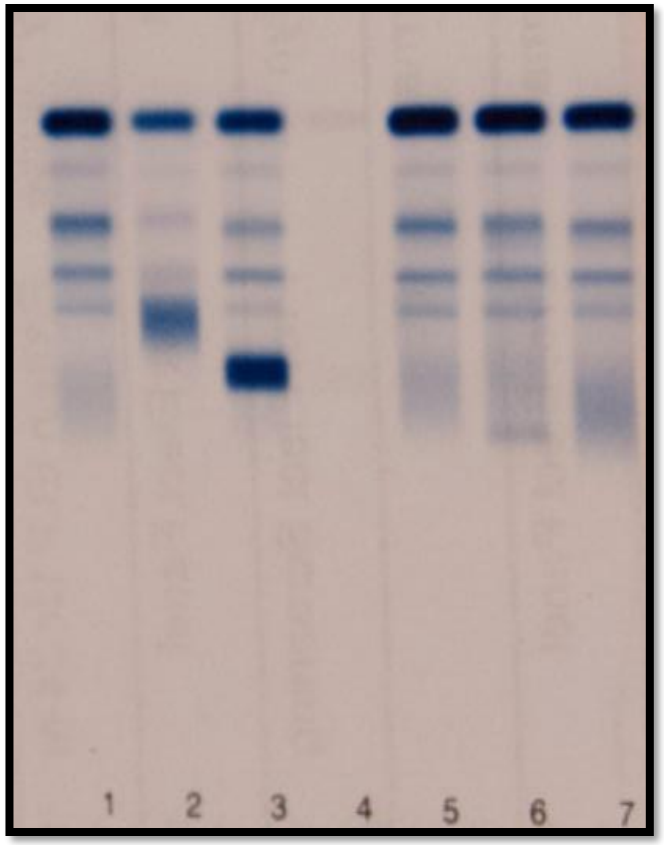
- The profession links technology and information to health and medicine.

- Lab results account for approximately 70% of the objective information used by physicians for the diagnosis, management, and resolution of patient health problems.

MEDICAL LABORATORY SCIENCE

What kinds of diseases do laboratory tests detect?

- Cancer
- Heart attacks
- Diabetes
- Bacterial and viral infections (COVID-19)
- Drugs of abuse
- Therapeutic drugs

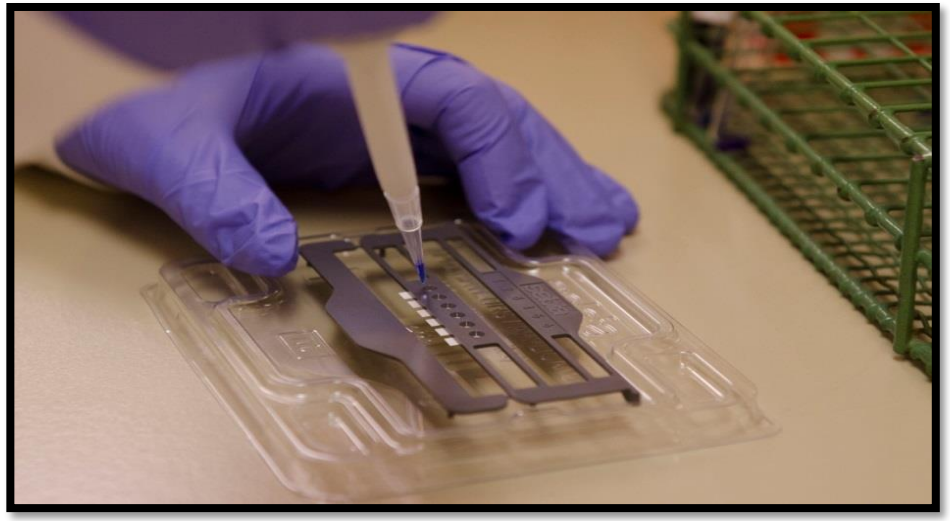


Serum Protein Electrophoresis

MEDICAL LABORATORY SCIENCE

What skills are needed?

- Problem solving skills
- Critical thinking skills
- Effective communication
- Multitasking
- Detail-oriented
- Work well both independently and as part of a team
- Commitment to the patient



MEDICAL LABORATORY SCIENCE

What are the educational requirements?

1. **College**
   - Bachelor of Science degree
2. **Clinical Internship**
   - NAACLS Accredited Medical Laboratory Science Program
3. **National Certification Examination**
   - ASCP

MEDICAL LABORATORY SCIENCE

Does Oklahoma have a NAACLS accredited Medical Laboratory Science program?

1. Saint Francis Health System, Tulsa
2. Comanche County Memorial Hospital, Lawton
3. Mercy Hospital, Ada/Ardmore/OKC

MEDICAL LABORATORY SCIENCE

Clinical Education

- Located onsite at Saint Francis Health System in Tulsa, Oklahoma
- 51 week clinical internship: May 23, 2022 – May 11, 2023
- Full-time program
  - 60% in clinical rotations within Saint Francis Health System
  - 40% in a classroom setting at Saint Francis Hospital

Phlebotomy
Hematology/Flow Cytometry
Chemistry
Immunology
Blood Bank
Microbiology
Genetics

Phlebotomy

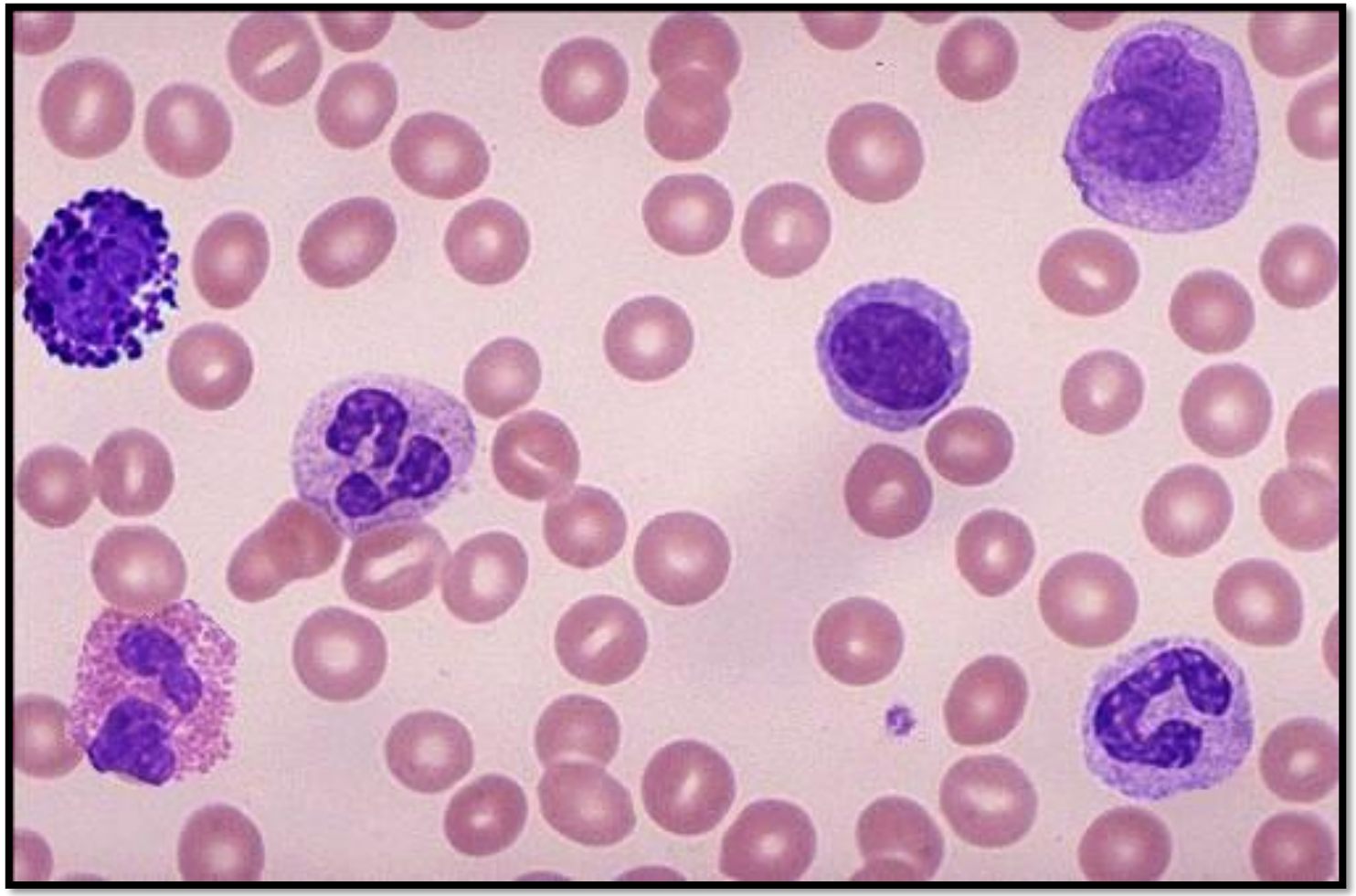
- Phlebotomy involves the proper collection, handling, and processing of blood specimens.

MEDICAL LABORATORY SCIENCE

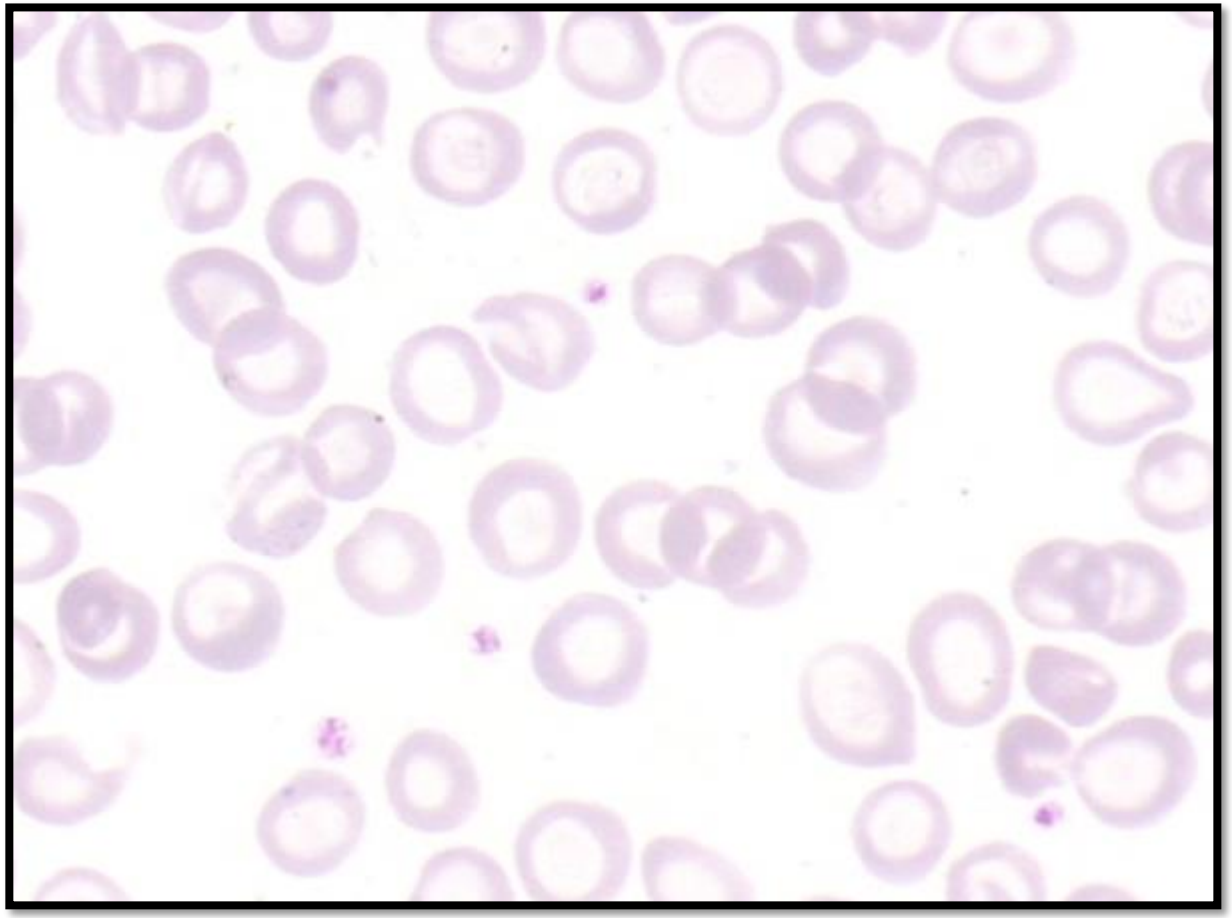
Hematology

- Evaluate normal/abnormal cells in blood
  - White blood cells
  - Red blood cells
  - Platelets
- Analysis of urine and other body fluids such as cerebrospinal fluid and pleural fluid
- Assessment of the blood clotting system
  - Monitor patients on blood thinner
  - Detect factor deficiencies

What is in a drop of blood?



What is wrong with these red blood cells?



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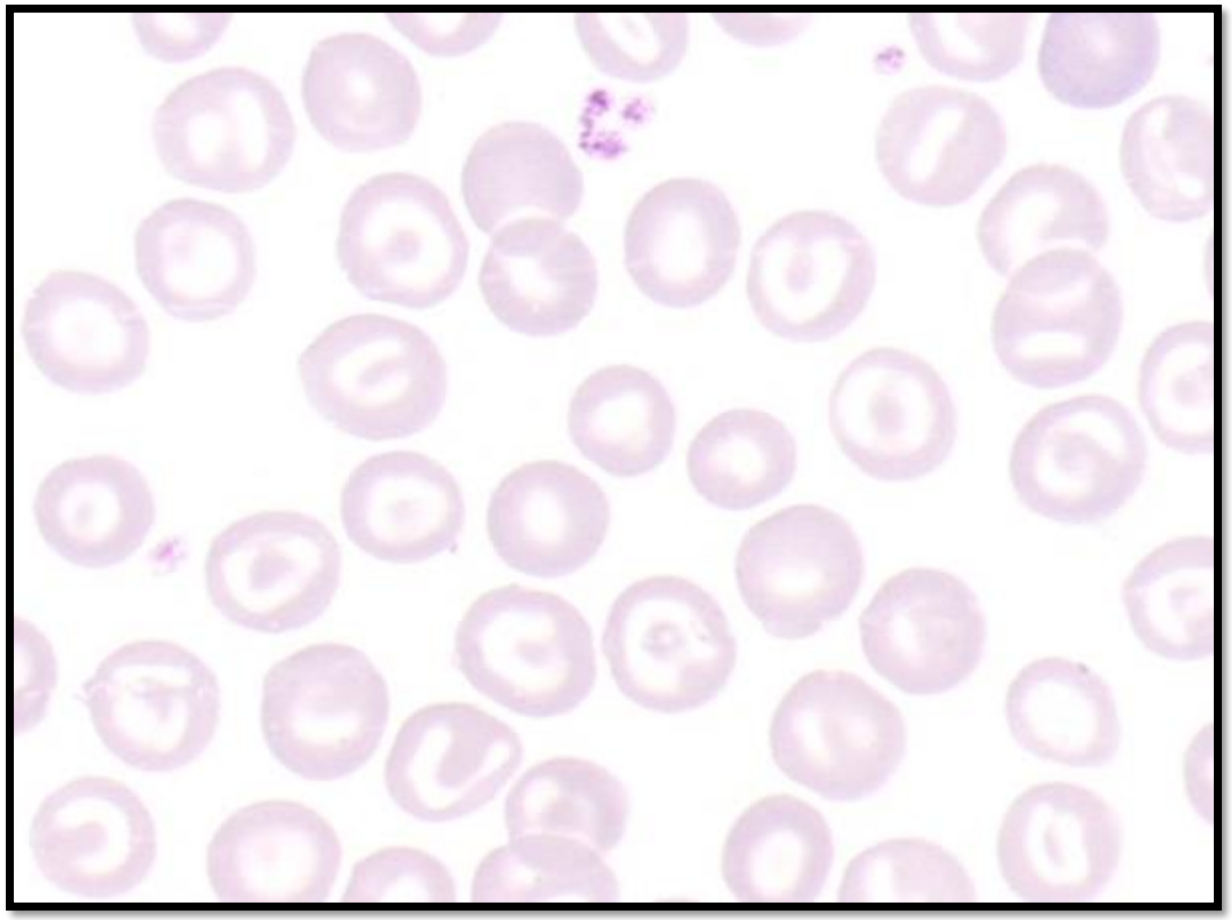

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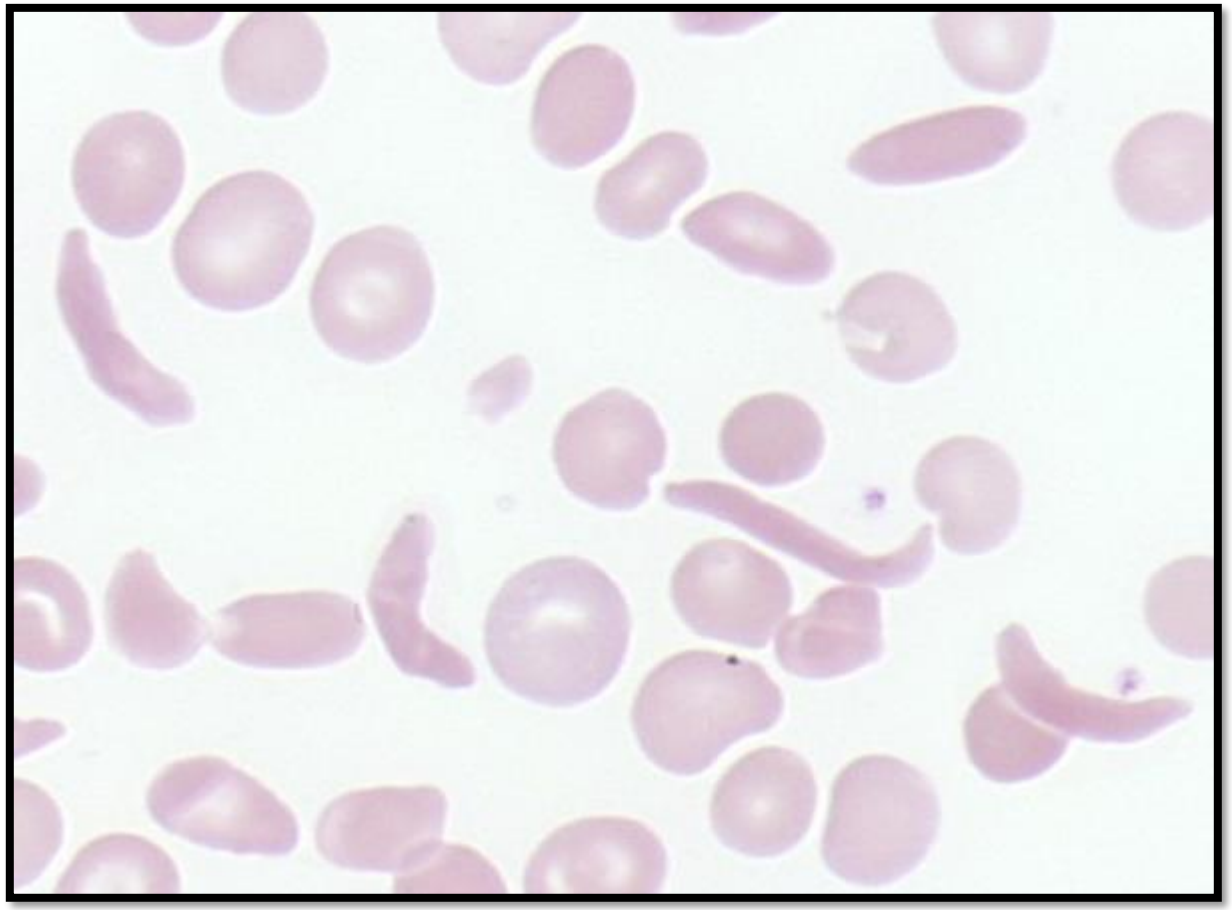
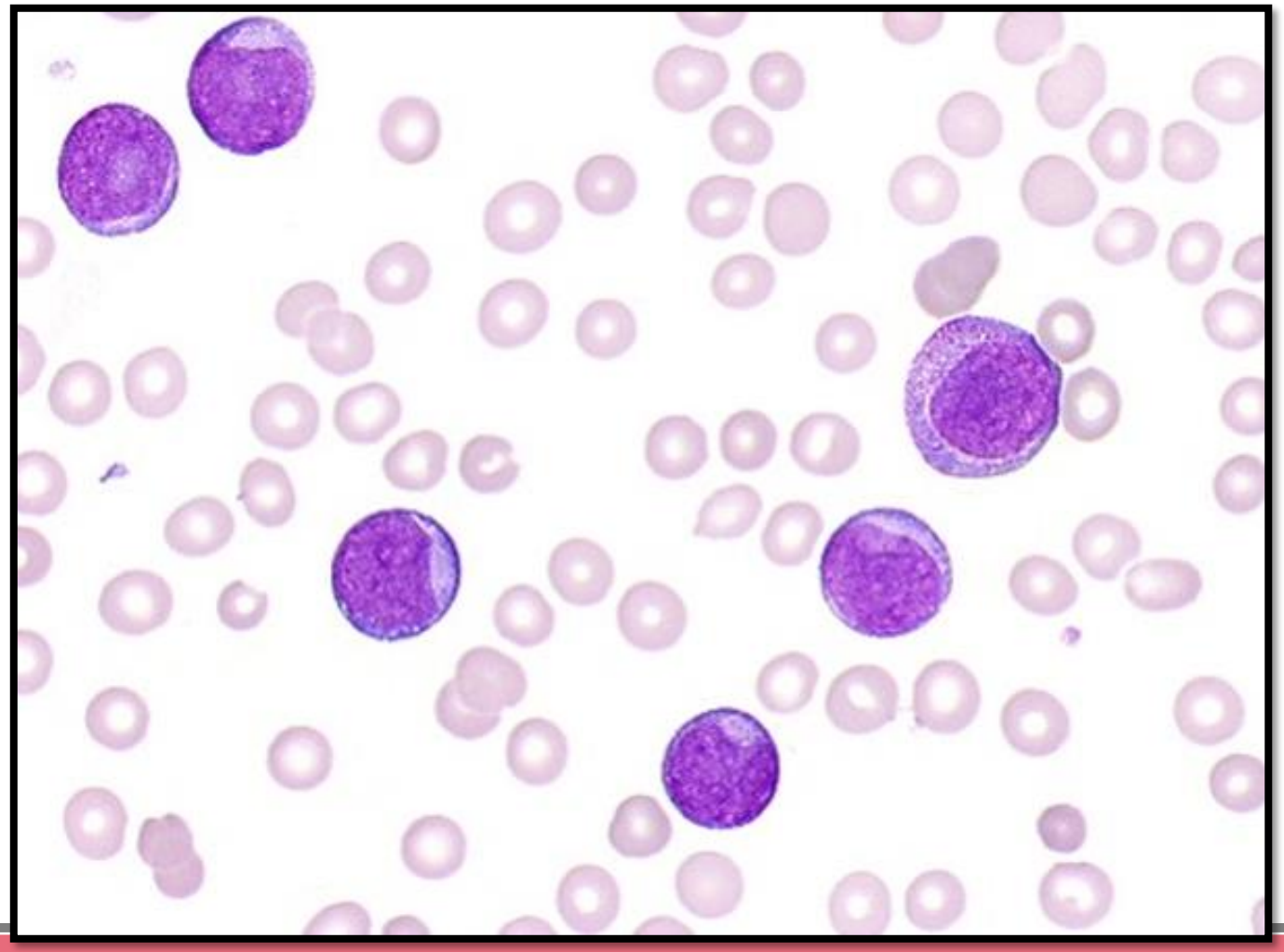


What is wrong with these white blood cells?



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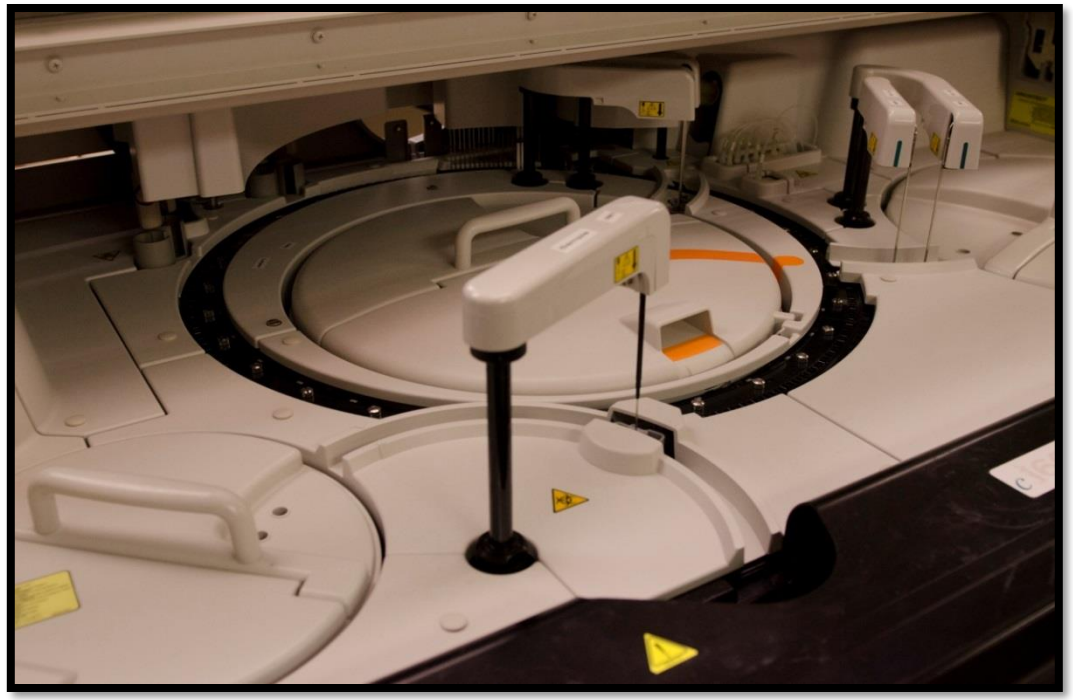
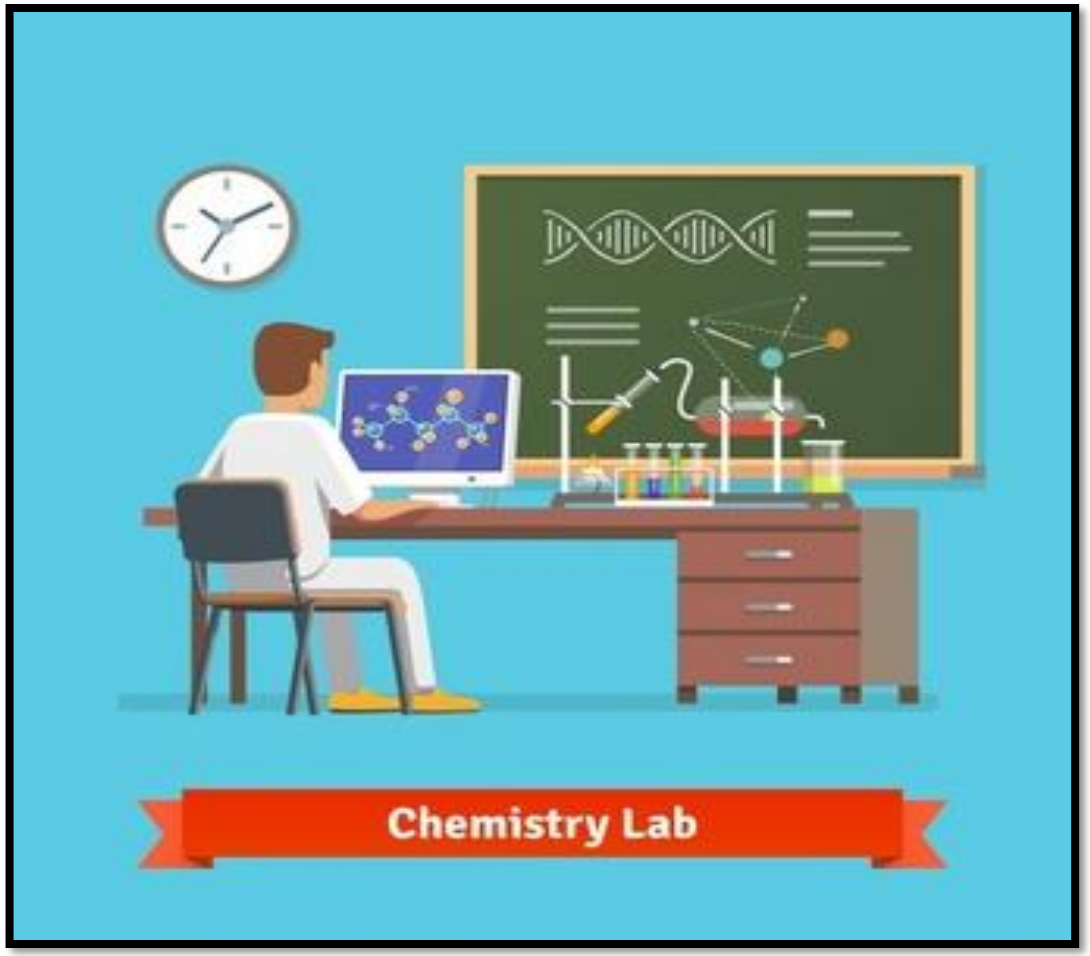
Chemistry

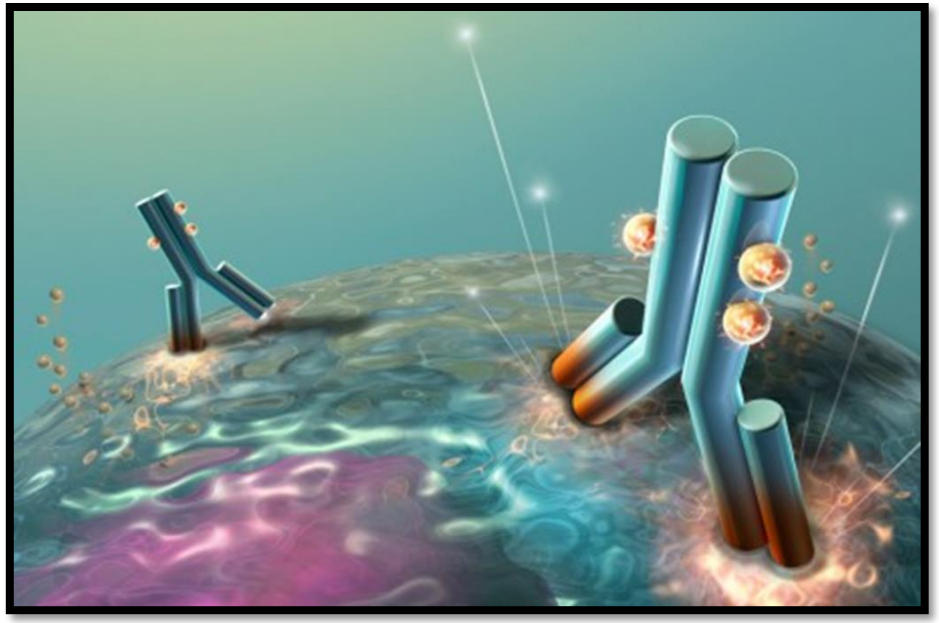
- Biochemical analysis of blood to assess metabolic disorders and organ function





Immunology

- The immune system is being bombarded by all sorts of microbes all the time.
- Even though we're not aware of it, it is saving our lives every day.
- Through immunologic techniques, we can detect allergies, autoimmune diseases, and infectious diseases.



Blood Bank

- Blood Bank performs pre-transfusion testing on red blood cells and serum in order to ensure that donated blood products are compatible with the recipient.

	Rh-hr					Kell						Duffy		Kidd		MNS				P	Xg	Lewis		Lutheran			Test Results		
Cell	D	C	E	c	e	K	k	Kp^a	Kp^b	Js^a	Js^b	Fy^a	Fy^b	Jk^a	Jk^b	M	N	S	s	P_1	Xg^a	Le^a	Le^b	Lu^a	Lu^b	Cell	IS	37	AHG
1	+	+	0	0	+	0	+	0	+	0	+	+	0	+	+	+	0	0	+	0	0	0	+	0	+	1	0	0	4+
2	+	0	+	+	0	0	+	0	+	0	+	+	+	+	0	0	+	0	+	+	+	+	0	0	+	2	0	0	4+
3	+	+	0	0	+	0	+	0	+	0	+	0	+	+	0	+	0	+	+	+	0	+	0	0	+	3	0	0	4+
4	+	0	0	+	+	0	+	0	+	0	+	+	0	0	+	+	+	+	0	0	0	0	0	0	+	4	0	0	4+
5	0	+	0	+	+	0	+	0	+	0	+	+	0	0	+	+	0	+	+	0	+	0	+	0	+	5	0	0	0✓
6	0	0	+	+	+	0	+	0	+	0	+	+	+	0	+	0	+	0	+	0	+	0	+	0	+	6	0	0	0✓
7	0	0	0	+	+	+	+	0	+	0	+	+	+	+	+	+	+	+	0	+	+	0	+	+	+	7	0	0	0✓
8	0	0	0	+	+	+	0	0	+	0	+	+	+	+	0	+	+	+	+	+	+	+	0	0	+	8	0	0	0✓
9	+	+	0	+	+	0	+	0	+	0	+	0	+	+	+	0	+	0	+	0	+	+	0	0	+	9	0	0	4+
10	+	0	0	+	+	0	+	0	+	+	+	+	0	+	0	+	+	0	+	+	+	0	0	0	+	10	0	0	4+
11	+	+	+	+	+	0	+	+	+	0	+	+	+	0	+	+	0	0	+	+	+	+	0	0	+	11	0	0	4+
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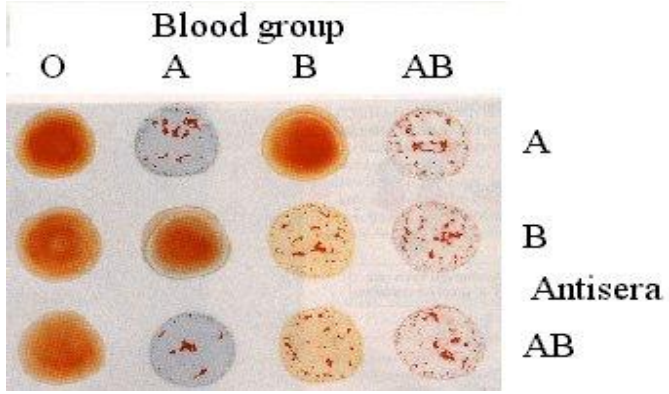
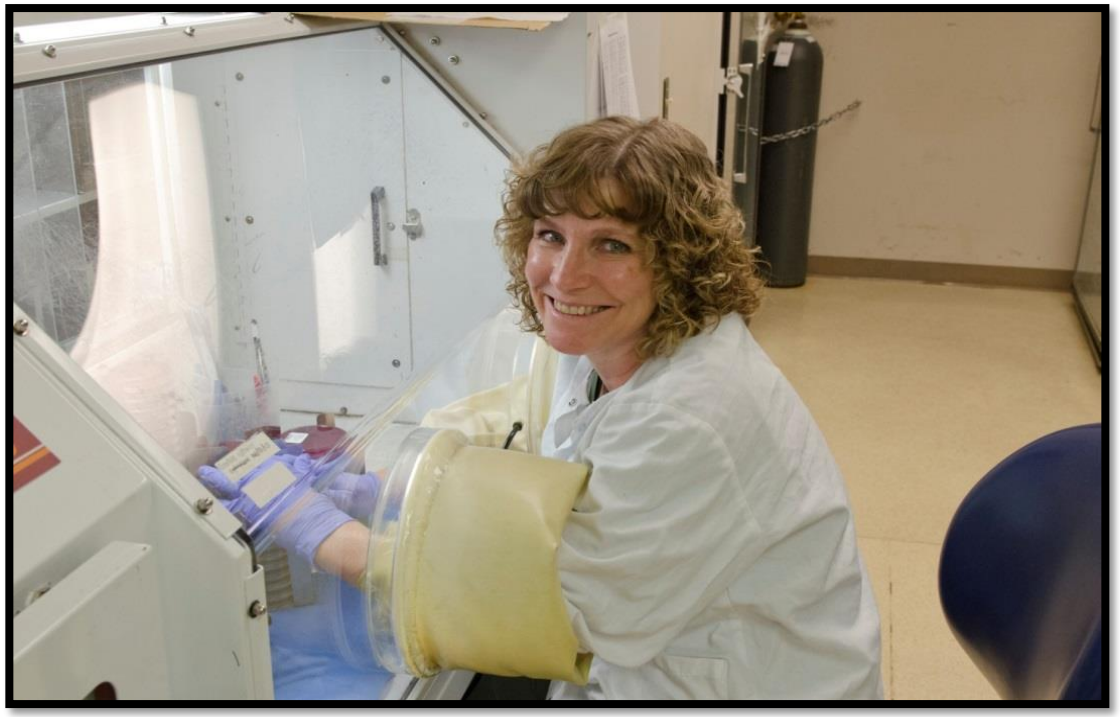


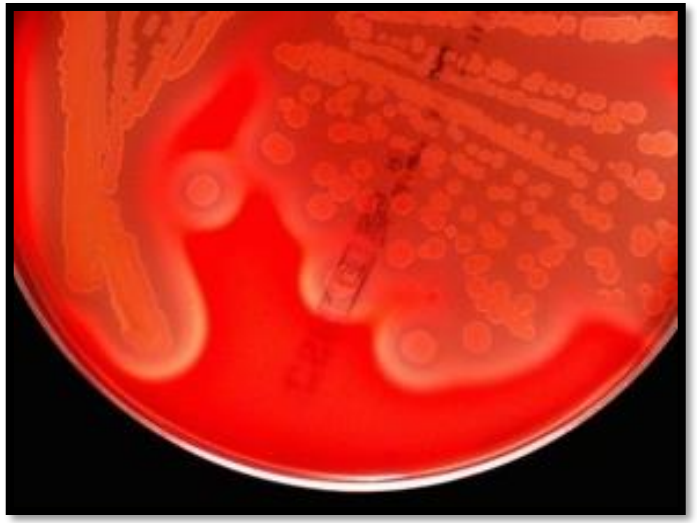
Microbiology

- Isolates, identifies, and performs antibiotic susceptibility testing on microorganisms.

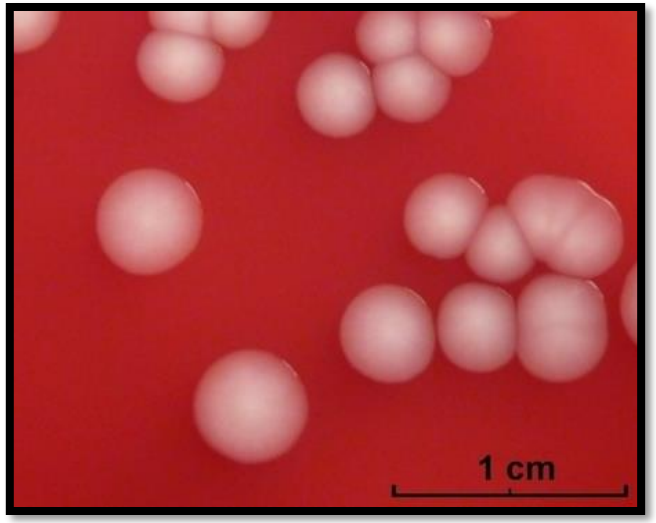


E. Coli

Staphylococcus



Salmonella



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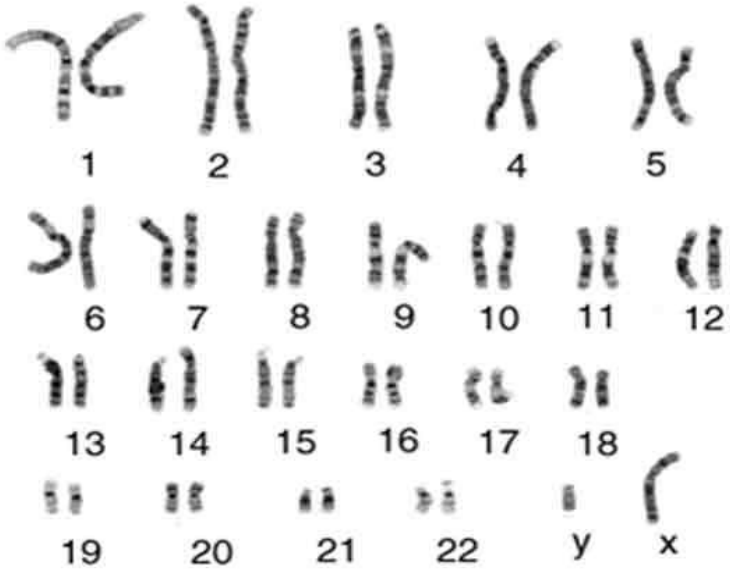
- Microbiology Respiratory Pathogen Panel by PCR
  - Adenovirus
  - Coronavirus (229E, KHU1, NL63, OC43)
  - Human Metapneumovirus
  - Human Rhinovirus/Enterovirus
  - Influenza A and B
  - Parainfluenza
  - Respiratory Syncytial Virus (RSV)
  - Bordetella pertussis
  - Chlamydophila pneumoniae
  - Mycoplasma pneumoniae
  - Bordetella parapertussis
  - Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV-2)

Genetics

- Molecular genetics involves amplification of DNA to detect genetic disorders.
- Cytogenetics consists of chromosome analysis.



MEDICAL LABORATORY SCIENCE

What are the admission requirements?

- Applicants must be one of the following:

1. Baccalaureate Candidate (**3** + **1** Option)
   3 years of college + **1** year MLS internship
   Degree will be in Medical Laboratory Science

2. Post Baccalaureate Candidate (**4** + **1** Option)
   Baccalaureate degree + **1** year MLS internship
   Degree will be in a Biology, Chemistry, or related major

MEDICAL LABORATORY SCIENCE

What are the admission requirements?

- Applicant must meet the minimum GPA for admission:
  1. 2.50 cumulative GPA and 2.50 cumulative GPA
  2. Grade of C or better in prerequisite classes
- Average incoming GPA is approximately 3.30

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What are the academic prerequisites?

- Biology (minimum of 16 credit hours)
  - Microbiology
  - Immunology
  - Anatomy and/or Physiology
- Chemistry (minimum of 16 credit hours)
  - General Chemistry (2 courses)
  - Organic Chemistry
  - Biochemistry
- Math
  - College Algebra or higher

MEDICAL LABORATORY SCIENCE

- Application Process: **Step 1**
  - Apply in the fall of the year preceding entry into the program.
  - Application and official transcripts are due by October 15th.
  - Online applications are available from www.occlsa.org
- Application Process: **Step 2**
  - Two online Academic Reference forms
  - Employer reference (if applicable)
  - Criminal background report through www.castlebranch.com

MEDICAL LABORATORY SCIENCE

- Selection Criteria
  - Interview (oral and written)
  - Career motivation
  - Knowledge of profession
  - Grade point average
  - Communication skills
  - Academic references
  - Employment reference
  - Background check

MEDICAL LABORATORY SCIENCE

- Employment/Scholarships
  - Part-time employment as a student lab tech is available on a limited basis during the year.
  - Scholarship opportunities are available from Saint Francis Health System, American Society for Clinical Pathology (ASCP), American Proficiency Institute (API), and American Society for Clinical Laboratory Science (ASCLS).

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- Completion of the MLS Program
  - Baccalaureate candidate (3+1 student) will earn 30 hours of college credit to complete a B.S. degree from the university and receive a certificate of completion and pin from the medical laboratory science program.
  - Medical laboratory science program graduates are eligible to take the national ASCP Board of Certification exam.
  - Graduation is not contingent upon passing the national certification exam.

MEDICAL LABORATORY SCIENCE

Three Year Average Program Outcomes		
	Saint Francis Health System	**NAACLS Benchmarks**
Graduation Rate	100% (36/36)	70%
Attrition Rate	0% (0/36)	N/A
Certification Pass Rate	94% (34/36)	75%
Job Placement Rate	100% (36/36)	70%
Retention Rate at SFHS	89% (32/36)	N/A

MEDICAL LABORATORY SCIENCE

- Perfect blend of science, medicine, and technology
- Challenging, interesting, continuously changing
- Excellent career outlook
- “I wish I had heard about this sooner!”

CONTACT A HOSPITAL PROGRAM DIRECTOR FOR MORE INFORMATION

Comanche County Memorial Hospital
3401 West Gore Boulevard
Lawton, OK 73505
Phone: 580-250-5848
Program Director: Stacey Paryag-Stevens MPA, AHI(AMT), MLS(ASCP)CM
Email: Stacey.Paryag@ccmhhealth.com
Phone: 940-781-3910

Mercy Hospital
430 North Monte Vista
Ada, OK 74820
Phone: 580-272-1625 or 580-421-1596
Program Director: Leah Babcock, MS, MT(ASCP)
Email: leah.babcock@mercy.net

Saint Francis Health System
6161 South Yale Avenue
Tulsa, OK 74136
Phone: 918-494-6342
Program Director:
Nate Harden, MS, MLS(ASCP)CM
Email: ndharden@saintfrancis.com